

CALFED BAY-DELTA PROGRAM
RESOURCE CATEGORIES AND ASSESSMENT VARIABLES
FOR THE PROGRAMMATIC EIR/EIS
OCTOBER 1996
DRAFT

I. PHYSICAL ENVIRONMENT

A. Surface-Water Hydrology

Important Changes to be Evaluated

Volume of flow

Timing of flow

Related Information to be Measured

Rainfall

Snowmelt

Groundwater discharge

Direct runoff

Evapotranspiration from program features (soil moisture, vegetation [e.g., terrestrial, agricultural crops, riparian, wetlands], open-water area)

Seasonal weather pattern variation

B. Groundwater Hydrology

Important Changes to be Evaluated

Groundwater supply

Conjunctive use supply

Related Information to be Measured

Basin storage capacity

Groundwater recharge

Groundwater withdrawals

C. Riverine Hydraulics

Important Changes to be Evaluated

Depth, width, and velocity

Related Information to be Measured

Slope of water surface and channel bed

Channel or floodplain roughness (resistance)

Water viscosity

Hydrographs

Channel geometry

Instream and bank erosion: channel loss;

riparian loss (e.g., from channel migration, recreation, wind, current); gravel loss;

conveyance loss

Sediment movement

D. Water Management Facilities and Operations

Important Changes to be Evaluated

Reservoir storage volumes, releases, and spills

Instream flow targets, deficits, and surpluses

Diversions/exports targets, deficits, and surpluses

Agricultural drainage volumes

Remaining opportunities for water management

Related Information to be Measured

Capacity
Elevation
Runoff
Flood control
Diversion targets
Instream targets

Instream targets
Runoff
Storage
Diversion targets
Transport

Runoff
Diversion targets
Diversion limits
Reservoir storage
Groundwater pumping

Rainfall
Irrigation
Soils
Drainage facilities

Spills/surplus outflow
Unused conveyance
Carryover storage
Urban stormwater drainage volumes

E. Bay-Delta Hydrodynamics

Important Changes to be Evaluated

Delta outflow

X2 location

Channel flows at key Delta locations

Related Information to be Measured

Delta inflows
Channel depletions
Exports

Outflow
Tidal mixing

Delta inflows
Channel depletions
Exports
River diversions
Transport

Water entrainment in diversions/exports

Delta inflows
Channel depletions
Exports
River diversions

F. Water Quality

Important Changes to be Evaluated

Ecosystem Water Quality

Related Information to be Measured

Metals:

Cadmium
Copper
Mercury
Selenium
Zinc

Organics/Pesticides

Carbofuran
Chlordane
Chlorpyrifos
DDT
Diazinon
Polychlorinated bipheyls (PCBs)
Toxaphene

Ammonia

Dissolved oxygen

Salinity (total dissolved solids [TDS],
electroconductivity [EC])

Temperature

Turbidity/Transparency

Urban Water Quality

Bromide

Nutrients

Pathogens

Salinity

Total organic carbon (TOC)

Turbidity

Viruses

Agricultural Water Quality

Boron

Chloride

Nutrients

pH

Salinity

Sodium adsorption ratio (SAR)

Turbidity

Temperature

G. Geomorphology, Soils, and Seismicity

Important Changes to be Evaluated

Surface soil erosion

Soil salinity

Subsidence caused by peat oxidation

Subsidence caused by groundwater withdrawals

Seismicity (risk of levee failure during seismic event)

Related Information to be Measured

Agricultural soil loss

Wind

Stormwater

Soil geology

Applied EC

Agricultural drainage

Peat content

Soil moisture

Ground disturbance and tilling practices

Groundwater levels

Aquifer clay content

Levee structural integrity

H. Air Quality

Important Changes to be Evaluated

Ozone

Carbon monoxide

Particulate matter

Related Information to be Measured

Construction activities

Agricultural operations

Pump operations

Construction activities

Agricultural operations

Pump operations

Construction activities

Agricultural operations

Pump operations

Wind and soil conditions

I. Noise

Important Changes to be Evaluated

Short-term construction noise

Noise from aquatic recreation (i.e., boating)

Noise from terrestrial recreation (i.e., hunting)

Noise from facilities operation

J. Traffic and Navigation

Important Changes to be Evaluated

Navigation

Railways

Ferries

Airports

Roadways

II. BIOLOGICAL ENVIRONMENT

A. Fisheries and Aquatic Resources

Important Changes to be Evaluated

Instream flow

Delta flow

Reservoir elevation

Temperature

Estuarine salinity

Sediment movement

Diversion impacts

Barriers

Habitat

Related Information to be Measured

Flow

Transport

Net flow

Tidal flow

Transport

Fish impingement

Entrainment

Predation

Physical habitat

Effect of flow on habitat

Effect of temperature on habitat

Effect of estuarine salinity on habitat

Effect of reservoir elevation on habitat

Water quality

Agricultural salinity
Thermal pollution
Dissolved oxygen
Nutrients
Toxicants
Transparency

Fishing

Commercial fishing
Sport fishing

Artificial production

Species interactions

Predation
Competition
Food availability
Disease
Non-native plants

B. Vegetation and Wildlife Including Special-Status Species

Important Changes to be Evaluated

Related Information to be Measured

Area and condition of habitat

Open water and tidal wetlands
Saline, brackish and freshwater wetlands
Riparian and riverine habitats
Upland habitats

Area of agricultural land use providing habitat value

Agricultural operations and land use practices on
habitat values

Connection and orientation of habitats

Number of known populations of special-status species

Area and condition of habitat occupied by
special-status species

Changes in non indigenous/introduced species
populations

Changes in ecological processes that sustain habitats

III. ECONOMICS AND SOCIAL ENVIRONMENT

A. Land Use

Important Changes to be Evaluated

Acres in agricultural use

Acres in open space and habitat use

Acres in developed use

Indian trust assets

B. Flood Control System

Important Changes to be Evaluated

Hazards to the levee system

Potential flood damage and resources at risk

Relative risk of levee failure

Cost of flood-damage protection

Related Information to be Measured

Overtopping failure (flood stage elevation)
Mass failure (potential for erosion, stability,
seepage, and seismic failure)

Existing and planned property values
Existing and planned utility and infrastructure
values
Distribution of values lost from levee failure
Natural resource values (including protected
species)
Cost of repair and rehabilitation of facilities
after levee failure
Maintenance of Delta water quality

Hazards (potential failures)
Values of resources at risk

Levee improvements (project and nonproject
levees)
Levee design standards and guidelines

C. Agricultural Economics

Important Changes to be Evaluated

Value of agricultural production

Cost of production

Related Information to be Measured

Acres in production
Crop prices
Crop choices
Crop yield

Cost of surface water used
Groundwater costs
Irrigation efficiency and costs
Production costs
Acres in agricultural production

Agricultural net income

Crop revenue
Production costs
Water transfers

Cost of water supply variability

Certainty in water supply and cost
Indirect/third-party impacts

D. Municipal and Industrial Water Supply Economics

Important Changes to be Evaluated

Related Information to be Measured

Cost of water supply

Surface-water supply and distribution
Groundwater pumping costs
Alternative water supplies and cost
Water transfer costs
Infrastructure costs for water conveyance and distribution

Cost of water shortage

Water supplies
Consumer willingness to pay and demand elasticity

Cost of treatment

Quality of water supply
Constraints to treatment

E. Fish, Wildlife, and Recreation Economics

Important Changes to be Evaluated

Related Information to be Measured

Recreation-related spending

Recreation use and opportunity
Distance traveled to recreation area

Recreation benefits

Value of recreation resource
Recreation use and opportunity

Commercial fishing harvest values

Income
Catch

Recreation employment and net income

F. Regional Economics

Important Changes to be Evaluated

Related Information to be Measured

Income

Agricultural income
Recreational expenditure
Commercial fishing income
Municipal and industrial water expenditure
Indirect income (i.e., third-party effects)

Employment

Agricultural
Recreation-related
Commercial fishing
Municipal and industrial water expenditure
Indirect employment (i.e., third-party effects)

Fiscal conditions

Property tax revenues
Sales tax revenues
Public costs/costs of actions
Indirect (i.e., third-party) fiscal effects

G. Power Production and Energy

Important Changes to be Evaluated

Quantity and value of energy produced

Quantity and cost of energy consumed

Related Information to be Measured

Reservoir elevation
Reservoir releases
Seasonal power value

Groundwater pumping
Surface-water pumping
Seasonal power costs

H. Recreation Resources

Important Changes to be Evaluated

Recreation opportunities

Recreation use

Related Information to be Measured

Resource conditions and availability

Regional population and demographics
Demand for recreation resources

I. Visual Resources

Important Changes to be Evaluated

Visual quality

Viewer sensitivity

J. Cultural Resources

Important Changes to be Evaluated

Risk to prehistoric sites

Risk to historic sites

Related Information to be Measured

Acreage of ground disturbance from
construction
Distribution of culturally sensitive landforms
Locations of known sites

Association of historic sites with land
conditions
Locations of known sites

K. Public Health and Environmental Hazards

Important Changes to be Evaluated

Area of mosquito breeding habitat

Area of habitat that supports other disease vector populations

Risk of contact between humans and vector populations

Risk of hazardous material and waste upset (construction and operation)

Related Information to be Measured

Known hazardous material sites

L. Utilities and Public Services

Important Changes to be Evaluated

Electrical supply and use

Water conveyance

Transportation facilities (e.g., roads, railroads, and ferry)

Deepwater ship channels and shipping ports

Natural gas fields and storage reservoirs

Underground pipelines

Communications facilities

Police, fire, and emergency services

M. Social Well-Being

Important Changes to be Evaluated

Community stability

Environmental justice

Related Information to be Measured

Demographics
Regional economics

Demographics
Regional economics